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The Inventory of Dragonfly Species in Kedung Kopong and Banyak Angkrem Areas in Kalirejo Village, Salaman-Magelang

Aap Ahmad Saefullah[1], Lala Latifah[2], Meylani Sa'adah[3], Novi Salsabila[4], Siti Muslimah[5]
[12345]Biology Department, Faculty of Science and Technology, UIN Sunan Kalijaga,
Jl. Marsda Adisucipto No 1 Yogyakarta 55281, Indonesia. Tel. +62-274-540971, Fax. +62-274-519739. [2]Email hafitalala@gmail.com

Abstract. Dragonflies are classified into the Odonata order. The existence of dragonflies can be used as bioindicators of good water, related to their life cycle. The difference of habitats in the Kedung Kopong and Banyak Angkrem areas affects the diversity of dragonflies found in the location. The purpose of this research was to determine the types of dragonflies and their habitats in the Kedung Kopong and Banyak Angkrem areas. The method used in this research is the point count, which is by tracing the predetermined transects and divides it into some points. The distance between the points is 15 meters while the diameter of the points is 10 meters. The result of data collection of dragonflies in the Kedung Kopong and Banyak Angkrem areas as a whole obtained 19 species which is divided into 7 families, they are *Aesnidae* (2 species), *Libellulidae* (10 species), *Calopterygidae* (1 species), *Cholorocyphidae* (1 spesies), *Coenagrionidae* (2 species), *Euphaeidae* (1 species), and *Platycnemidae* (1 species). Habitats in the Kedung Kopong areas is the river. Meanwhile, in Banyak Angkrem are settlements and hills.

Keywords : Habitat, Inventory, Odonata, Point count.

Running Title : The inventory of dragonfly species in Kalirejo village

INTRODUCTION

In terms of biodiversity, Indonesia is known as one of the "Megadiversity" Countries, a country that has high biodiversity in the world. One of the diversity is the large population of dragonflies. On every island in Indonesia, especially in the Java-Bali island, we will find thousands of types of dragonflies from various families. Dragonflies are a group of insects that function as bioindicators of environmental quality in waters. Waters are one of the best habitats for dragonflies because from nymphs, dragonflies spend their time in water, for example rice fields, lakes, swamps, rivers and ponds and it is in the waters that dragonflies spend their daily time (Patty, 2006).

Dragonflies are classified into the Odonata order. Odonata means that the toothed jaw at the end of the labium (lower lip) has sharp protrusions (spines) resembling teeth. Odonata consists of two suborders, namely the suborder Anisoptera (common dragonflies) which have a fatter body and fly quickly, the head is not elongated in a transverse position but is rounded, has a rear wing that is wider at the base than the front wings and the wings are stretched horizontally at rest. . Whereas Zygoptera (needle dragonflies) have a slender body, smaller and fly slowly than ordinary dragonflies, the elongated head in a transverse position has the same shape front and rear wings, both of which are narrow at the base and when resting are folded over the body together or slightly widened (Borror, 2005)

The body of a dragonfly consists of the head, thorax (chest), and abdomen (stomach) and has six limbs. The abdomen consists of 6 to 10 segments and appendages. Its eyes are made up of thousands of lenses made with compound eyes. Dragonflies have two pairs of wings with venation which have a distinctive pattern for each species (Feriwibisono et al., 2013).

Dragonflies (Odonata) are insects that act as predators both in water and on land for the dragonflies themselves. But from its role as a predator, it actually balances the population for other insects in the ecosystem (Ansori, 2009). The number of members of this Odonata scattered around the world is estimated to be 5000-6000 species in various habitats and those scattered in Indonesia reach 15% of the total, meaning that it is estimated to be up to 700 species (Sigit et al., 2013). Currently in Indonesia there is still very little research on dragonflies so that many species data are out of date and many need to be updated. Therefore, it is necessary to research the diversity of dragonflies in Indonesia (Feriwibisono et al., 2013). Therefore purpose of this research was to determine the types of dragonflies and their habitats in the Kedung Kopong and Banyak Angkrem areas.

MATERIALS AND METHODS

Observations about dragonflies were carried out in the Kedung Kopong and Banyak Angkrem areas. The time of the research was divided into 3 times, That is 1st of March 2020, 7th– 8t^{h} of March 2020 and 14th – 15th March 2020 every morning and afternoon. The method used in this research is the point count, which is by tracing the predetermined transects and divides it into some points. The distance between the points is 15 meters while the diameter of the points is 10 meters. After reaching a predetermined point, dragonfly encounters are recorded for about 10 minutes each and After reaching a predetermined point, dragonfly encounters are recorded for about 10 minutes each, then photographed. dragonflies that have not been identified will be identified through the photo. Data

processing was done by counting the number of species found at each point during the observations.

The tools used during the observation were stationary, chest boards, tally sheets, insect nets, cameras and identification books (Dragonflies of Yogyakarta, Diversity of Dragonflies in the Special Region of Yogyakarta). Then the materials used in this observation are various types of dragonflies found at the data collection location.

RESULTS AND DISCUSSION

Based on the data generated from the identification of dragonflies in the Kedung Kopong area and Banyak angkrem found 19 species which is divided into 7 families, they are Aesnidae (2 species), *Libellulidae* (10 species), *Calopterygidae* (1 species), *Cholorocyphidae* (1 spesies), *Coenagrionidae* (2 species), *Euphaeidae* (1 species), and *Platycnemidae* (1 species).

Subordo	Family	Spesies	count individually for each test			
			1	**2**	**3**	**4**
Anisoptera	*Libellulidae*	*Agrionoptera insignis (LC)*	0	1	0	0
		Cratilla lineata (LC)	0	1	0	1
		Diplacodes trivialis (LC)	0	6	4	2
		Neurothemis ramburii (LC)	1	0	1	1
		Neurothemis terminate (LC)	25	22	8	18

Table 1. data on identification of odonata in kedung kopong area

Subordo	Family	Spesis	Count individually for each test				
			1	**2**	**3**	**4**	**5**
Anisoptera	*Aesnidae*	*Gynacantha musa (NT)*	0	0	2	0	4
		Gynacantha ubinterupta (LC)	0	0	0	1	0
	Libellulidae	*Agrionoptera insignis (LC)*	1	0	1	0	2
		Neurothemis ramburii (LC)	0	2	1	2	1
		Neurothemis terminate (LC)	4	1 4	1 0	1 6	6
		Orthetrum Sabina (LC)	1	4	5	1	6
		Orthetrum testaceum (LC)	0	0	0	0	1
		Potamarcha congener (LC)	0	0	1	4	2
		Zyxomma petiolatum (LC)	0	0	1	0	0
Zygoptera	*Calopterygidae*	*Neurobasis chinensis (LC)*	0	0	0	0	1
		Vestalis luctuosa (LC)	0	0	0	0	1
	Chlorocyphidae	*Heliocypha fenestrate (LC)*	0	3	1 1	1 7	7
	Coenagrionidae	*Pseudagrion pruinosum (LC)*	0	0	0	0	3
	Euphaeidae	*Euphaea variegate (LC)*	0	1	2	5	2
	Platycnemididae	*Copera marginipes (LC)*	5	1 3	1 6	1 3	2 3
		Orthetrum Sabina (LC)	56	31	49	16	
		Orthetrum testaceum (LC)	0	0	1	0	
		Pantala flavescens (LC)	101	56	23	50	
		Potamarcha congener (LC)	6	7	21	7	
Zygoptera	*Coenagrionidae*	*Agriocnemis femina (LC)*	0	0	7	0	
		Pseudagrion pruinasum (LC)	0	1	0	0	
	Euphaeidae	*Euphaea variegate (LC)*	0	0	0	1	
	Platycnemididae	*Copera marginipes (LC)*	0	4	11	2	

Table 2. data on identification of odonata in Banyak Angkrem area

From the results of data collection, it can be seen that there are differences in the diversity of dragonfly species in Kedung Kopong and Banyak Angkrem. In Banyak Angkrem found 13 species of dragonflies which are divided into 4 families, namely *Libellulidae* (9 species), *Coenagrionidae* (2 species), *Euphaeidae* (1 species), and *Platycnemididae* (1 species). The species most commonly found in Banyak Angkrem is *Pantala flavescens*, with as many as 230 individuals. This species can be found flying in groups in the area around the hilltop where it is a large and open area. Apart from *Pantala flavescens*, the most common species is *Orthetrum sabina* which reaches 152 individuals. During the data collection, this species was found perching on grass and low tree trunks. Several individuals were also found eating other dragonflies. On the other hand, the least number of individuals encountered was *Agrionoptera insignis* and *Orthetrum testaceum*, namely 1 individual. In the Banyak Angkrem area, several needle dragonflies were also found, namely *Agriocnemis femina* and *Copera marginipes* which were found perching on plants near ponds, and *Euphaea variegata* which perches on plant leaves. Several *Copera marginipes* were found in a tandem position near the pond.

Unlike with the species found in Banyak Angkrem, in Kedung Kopong, more types of needle dragonflies (*Zygoptera*) were found. In Kedung Kopong, 8 species of dragonflies from the suborder *Anisoptera* were found and 6 species of dragonflies from the suborder *Zygoptera*. The most number of individuals found in Kedung Kopong is *Copera marginipes* with 70 individuals. This species is found perching on plants around rivers and ponds, some individuals are found in a tandem position. There were found rare species, namely *Neurobasis chinesis* and *Gynacantha musa*. *Neurobasis chinesis* was found to fly and perch from rocks to plant branches, then perch on leaves near rivers when the weather is sunny and there is bright lighting. Meanwhile, Gynacantha *musa* was found perching on the roots of a coconut tree which is located on the edge of a river and on a plant that is quite dense so that the perch is classified as shady or dark. In addition, there

were also species of *Vestalis luctuosa* and some *Euphaea variegata*.

The existence of the dragonfly is closely associated with the water state (Setiono, et al., 2017). Chemical-contaminated waters and the loss of vegetation around the water cause a decrease in the presence of the dragonfly in a region (Nugrahani, et al., 2014). This accounts for the differences in dragonfly species found at each location. The dragonfly in the Banyak Angkrem areas can be found practically all over the hill. But more can be found of dragonflies from subordo Anisoptera because of the larger wing shape to have great mileage (Nugrahani, et al., 2014). The water of Banyak Angkrem are private ponds close to settlements and forests. Additionally, Banyak Angkrem areas are also exploited for agriculture fields at the top of the hill and rice padded at the bottom of the hill. The subland level of the plateus and the thin canopy that give the large amount of Banyak Angkrem to their considerable solar intensity. This matches the behavior of the dragonfly that basins in the sun to strenghten the wing of the drgagonfly and this increase its flight power (Hidayah, 2008).

Kedung Kopong areas has streams of water flowing in the middle of the forest and not far from citizen settlements. This river is the stony stream with rushing currents and still. Around the river there also been found a stagnant waters with abundant vegetation, so that the intensity of sunlight is less high and the ground is more moist. The standing water that covered with plants provide a comfortable habitat for the dragonfly (Setiono, et al., 2017). More dragonflies have been found here from subordo Zygoptera becausse the majority of common Zygoptera are found active near the water (Setiono, et al., 2017). The discovery of some dragonfly species such as *Vestalis luctuosa* and *Euphaea variegata* suggest tat the water quality of the environment is still good because these species are breeding only in clear water (Setiono, et al., 2017).

description of the morphology and habits of dragonflies as follows :

1. *Orthetrum Sabina* (Drury, 1770)

Orthetrum Sabina is the species found in both observation sites, both morning observations and evening observations. 17 individuals were found in Kedung Kopong which is a water area and 152 individuals in Banyak Angkrem which is a secondary forest area. This dragonfly has a black-green striped thorax and black legs. Abdomen slender in black and white, first to third segments the same color as the thorax, seventh to tenth segments black, with white tufts. *O. Sabina* was found flying and some perched on the grass.

According to Kamaludin et al (2016), this dragonfly is known as the green sambar dragonfly, belonging to a cosmopolitan species because it is distributed to various areas, is tolerant of environmental pollution and disturbances. This dragonfly is a cannibal dragon, because it is often observed to eat the same species or other dragonfly species which are smaller and often perch on grass or logs when mating. This dragonfly has an abdomen 30-35 mm with a wing length of 32-35 mm (Setiyono et al., 2017).

2. *Orthetrum testaceum* (Burmeister, 1839)

This dragonfly was only found in one individual at the Banyak Angkrem location in the afternoon observation which is a secondary forest area. Based on observations, this dragonfly has a chestnut brown color with a bright red abdomen. Transparent wings with slightly brownish roots on the hind wings. Found perching on a dry branch.

According to Setiyono et al (2017), this dragonfly is often referred to as the scarlet dragonfly. Has a body size with males are orange-brown on the thoracic, and bright red on the abdomen with an abdominal size of 43-48 mm. Brownish-gray compound eyes with red frons. Dark hind wings at base measure 34-38 mm. Very similar to *Orthetrum chrysis,* but *O. testaceum* has no hook at the bottom of R2. The color of the thorax and eyes of the *O. testaceum* is lighter. The female dragonfly is yellowish brown, with transparent hind wings all over. These dragonflies are active from morning to evening, usually perching on dry twigs or small plant stems and leaves around the water with their wings covering their thorax.

3. *Argriocnemis femina* (Brauer, 1868**)**

Argriocnemis femina is a needle dragonfly found in Banyak Angkrem with 7 individuals on the morning observation. Found in a place that has a puddle with some water plants on it. Based on observations, the *Argriocnemis femina* has a small body size with transparent wings. It has a green thorax with a thick black stripe on the sides and top. The upper eye is black and the bottom is green. The abdomen is black and green on the underside with an orange tassel and has a shorter serki.

This dragonfly is often called the coquettish needle dragonfly. In female dragonflies usually have many color variations (polymorphism). Young individuals are bright red-black. While adult individuals are black-green-yellow. Its main feature is densely packed on the posterior edge of the front thorax, which sticks upward in a square shape (Setiyono et al., 2017).

This dragonfly is active during the day and perches on the leaves and branches of the trees. Living around the water rarely flies and perches a lot to stalk prey. It can be found in waters with low light intensity and in the vicinity there are lush plants (Hanum et al., 2013).

4. *Pseudagrion pruinosum* (Burmeister, 1839)

Pseudagrion pruinosum is one of the *Zygoptera* dragonflies found in the Kedung Kopong location which is a water location with 3 individuals and 1 individual found in Banyak Angkrem. Based on observations, this dragonfly has a small body size with a blue thorax with a hint of white. The wings are transparent and are shorter than the length of the abdomen. Has compound eyes that are black on the top and reddish brown on the bottom. Found perched on leaves near water. The abdomen is black with the tip of the abdomen light blue.

This dragonfly is often called the metallic needle dragonfly. It is said so because this dragonfly has a black abdomen and becomes metallic in color when exposed to sunlight measuring 31 mm. This dragonfly usually perches on the leaves or stems of aquatic plants above watercourses. Has transparent wings measuring 24-27 mm (Setiyono et al., 2017).

5. *Neurothemis terminata* (Ris, 1911)

This dragonfly is a type of dragonfly that is found in both observation sites. There were 73 individuals in Banyak Angkrem and 50 individuals in Kedung Kopong both in the afternoon and morning observations. Found male dragonflies and female dragonflies. Based on observations, male dragonflies have a thorax that is red-brown in color with a dark red abdomen and has black lines on the sides and top. The wings are red from the base to the pterostigma with a straight edge and the rest is transparent. In the female Neurothemis terminata dragonflies have a yellow abdomen with a black outline. The wings are transparent with a slightly brown tip. Many dragonflies are found perched on the branches.

According to Kamaludin et al (2016), this dragonfly is medium in size, the body morphology is similar to that of other Neurothemis species, the difference is that the hind wings are not curved. Both wings are brownish red from the base of the wings to the top touching the pterostigma, the rest are transparent, measuring 28-30 mm. The abdomen is dark red with a black stripe measuring 25 m. The black color of the abdomen gradually thickens towards the end of the abdomen. Usually this dragonfly perches on dry twigs, leaves and rocks. Fly fast and far when distracted. This dragonfly has the local name that is "capung-jala lurus"(Setiyono et al., 2017).

6. *Heliocypha fenestrata* (Burmeister, 1839)

Heliocypha fenestrata is a species found in Kedung Kopong which is a water area. There were as many as 20 individuals in the afternoon observation and the number of individuals in the morning observation was not much different, namely 18 individuals. This dragonfly was seen perched on twigs and leaves near the water. Based on observations this dragonfly has a small body size. The male dragonfly has a thorax with several colors including pink, and a little light blue on the sides. It has brownish wings with a transparent base and when exposed to sunlight it reflects a slightly pink color. Its wings are longer than the abdomen. The abdomen of this dragonfly has a black color that experiences thickening towards the tip. In female dragonflies tend to be yellowish brown. The abdomen is black with thickening towards the tip of the abdomen and an enlarged end of the abdomen. The wings are brownish. The thorax in females does not have several colors like males. Females only have black-brown and golden yellow on the thorax.

This dragonfly, has a size of 21 mm with a wing length of 20 mm. This dragonfly has the local name that is "capung batu merah jambu", said so because this dragonfly has a characteristic on the thorax which has a pink stripe on the humeral median part, clearly visible in adult individuals. This dragonfly often perches on leaves and twigs close to water sources. Occasionally perches on tall, shady leaves (Setiyono et al., 2017).

7. *Euphaea variegata* (Rambur, 1842)

Euphaea variegata is a large needle dragonfly. This dragonfly was found in both observation sites, namely 10 individuals found in Kedung Kopong in the morning and evening observations and one individual was found in Banyak Angkrem on the afternoon observation. Based on observations, *Euphaea variegata* tends to be black and has a black body color. The thorax is black with a hint of yellow. The abdomen is metallic black with dark black wings, but when exposed to sunlight it will reflect a bluish purple color. They were found perching on branches and some were found flying in areas near water or in the shade.

According to Setiyono et al (2017), this dragonfly has the local name that is "capung intan sunda" which is a needle dragonfly but has a body size unlike needle dragonflies in general because it has a fairly large body size, namely 46.7 mm, abdomen and 29.1 mm wings. It has a metallic black abdomen with black wings. When folded, you can see a metallic rainbow pattern which is dominated by purple and blue in the center of the hind wings. Legs are metallic black. The head is black with a hint of white under the eyes. Black and yellow thorax on the syntax, and metallic blue on the dorsal side. In female dragonflies, almost similar to male dragonflies with a yellow color on the wider thorax. The overall color is more muted. This dragonfly is similar to Vestalis luctuosa. Breeds in clear rivers, both with dense and slightly open vegetation.

8. *Vestalis luctuosa* (Burmeister, 1839)

Vestalis luctuosa is a dragonfly found only in Kedung Kopong with 1 individual. This dragonfly has the local name that is "capung metalik biru", which is a large needle dragonfly (Setiyono et al., 2017). Males metallic blue all over the body. Darker metallic blue on the eyes and wings. The color of the female body is much different from that of the male. The eyes are black, the thorax is metallic green, the wings and abdomen are metallic brown. This dragonfly was found flying in an area near the water. Usually this type of dragonfly flies with fast wings under the shady canopy not far from fast flowing rivers, it is often found in the same habitat as Euphaea variegata (Joko et al., 2007).

Compared to female dragonflies, male dragonflies appear to be more active in flying with upward and downward movements along the water surface. When passing through the swift current, the rhythm of flying can be seen following the surface waves of the water. Female dragonflies sometimes also do this movement, only movement is not directed. When flying, only the front wings are actively moving, the front wing flaps are very similar to butterfly "skippers". Therefore, the strength of the flight movement only rests on the front wing pair, while the rear wing pair even though its position is stretched does not move, its function is only as a support or balance (Fraser, 1934). According to Setiyono et al (2017), this dragonfly has a size of 45.55-55.55 mm with a wing length of 34.3 mm.

9. *Copera marginipes* (Rambur, 1842)

Copera marginipes were found in both observation sites with 70 individuals found in Kedung Kopong which is a water area and 17 individuals in the Banyak Angkrem area which is a secondary forest area. This dragonfly has the local that is "capung hantu kaki kuning" and is a medium-sized dragonfly (Setiyono et al., 2017).

This dragonfly was found perching, flying and mating in the thickets near the water. Males are predominantly black and yellow. Black thorax with yellow stripes. Black abdomen with a white bracelet that becomes a barrier between the segments. The R8-R10 is white. The abdomen measures 30.5 mm, has transparent wings with visible wing venation measuring 20 mm. Black compound eyes with clearly visible horizontal white lines. Yellow feet that characterize this species. Females have a darker or browner color. While young individuals are white (Setiyono et al., 2017).

His habit of flying moves from one plant to another above the flow of water. Every now and then scrambling for a place to land with dragonflies of the same species. Several couples mate in one location. Females are often seen further away from the water. Habitat is generally found among bushes along river banks (Setiyono et al., 2017).

10. *Neurobasis chinesis* (Linnaeus, 1758)

Neurobasis chinensis was only found in Kedung Kopong which is a water area with 1 individual in the afternoon observation. The dragonfly which has the local name that is "capung metalik hijau" this dragonfly is a large needle dragonfly found in Kedung Kopong during the afternoon observation. In male dragonflies with emerald green, metallic wings with dark tips. Dark upper eye, white bottom. There is a light brown stripe on the metallic thorax. The female is similar to the male dragonfly. Transparent wings with brown venation and white spots (Sigit et al., 2013).

Wing size 32-40 mm. Has a body with a length of 32-40 mm. This dragonfly habit in male species is very active in patrolling and defending areas along rivers, especially with high light intensity. Perched on leaves, twigs, or rocks. Calopterygidae prefer aquatic habitats in the form of ditches or rivers with slow to fast currents, which flow in protected areas or in forests with a maximum height of 2000 m (Lieftinck, 1934).

11. *Neurothemis ramburii* (Brauer, 1866)

This dragonfly was found in both observation sites with 6 individuals. Based on observations, this dragonfly is medium in size, dark red in color with red wings with transparent tips and a curved red pattern. Abdomen dark red with a few black lines above and on the sides of the abdomen. Found perched on the end of a bamboo branch.

According to Setiyono et al (2017), this dragonfly is often referred to as the dragonfly-net curve, a medium-sized perch dragonfly. The male has a dark red abdomen measuring 25 mm in size with a black stripe on the top and sides that gradually thickens towards the end of the abdomen. R10 black with red tassel. Has red wings with transparent tips measuring 28-30 mm. Females have a more yellow-brown color. The wings are older than the body with transparent wing tips. Usually perches on dry twigs, leaves and rocks. Fly fast and far when distracted.

12. *Gynacantha musa* (Karsch, 1892)

Gynacantha musa is a dragonfly species that is included in the basiguttata group because it has a wide end and epiprox that is long or half the length of the serki (Setiyono et al., 2017). Based on observations this dragonfly was found in Kedung Kopong with 6 individuals. In observing this species, it was found perching on the roots and branches of trees around the banks of the Kedung Kopong river. This dragonfly is often called the umbai-elbow-circular dragonfly because it has a distinctive tuft.

According to Setiyono et al (2017), male dragonflies of this species have a green color on the thorax and eyes. The frons is T-shaped. On the first and second segment, it looks bulging and starts to narrow at the third segment and has a blue lobe. It has a distinctive umbai and is very different from other species of Gynacantha members. Serki in this species are long and very wide, almost box-shaped. Has bristle confined to the inside of the serki which extends, so it looks like a toothbrush. The length of the epiprok of this species is half the length of the serki, which is black at the base and pale yellow from the middle to the tip. Abdomen measuring 52 mm with a wingspan of 48 mm live solitary.

13. *Gynacantha subinterrupta* (Rambur, 1842)

During the observation of this species, only 1 individual was found on the banks of Kedung Kopong. This dragonfly has the local name that is "capung edar umbai temu" this dragonfly also large dragonfly. This species has a size larger than the other dragonflies. The head and belly are bluish green. Compound eyes are pale blue with a yellowish brown face, frons with a T-shape marker. It has a green thorax, a green base of abdomen with blue spots on the third segment looks slender and on the other aabdomen segment is dark with green patches. Serki length and size of the epipro one third of the length of serki. At the end of the serki tapered inward, the difference in the tip of the serki is what distinguishes this species from G. dohri. Meanwhile, the female has the same characteristics but the color is paler.

According to Setyiono et al (2017), this dragonfly is crepuscular, very attractive to light and sometimes enters the house at night. Its body size reaches 67-72 mm with a wingspan of 44 mm. Besides this dragonfly lives solitary.

14. *Agrionoptera insignis* (Rambur, 1842)

Agrionoptera insignis is a species of dragonfly found in the two observation locations, in the Kedung Kopong area and the ponds in Banyak Angkrem. From the observation data found 5 dragonfly species, namely 4 in Kedung Kopong and 1 in Banyak Angkrem. This species is often dubbed the black perch dragonfly.

This male dragonfly has an abdominal length of 37-41 mm with a wing length of 29-30 mm and is red in color with a thick belly at the base then getting smaller. Whereas females have a brownish orange belly. The shape is similar to males, but the syntax is greenish (Nafisah et al., 2015). This dragonfly species is active during the day, usually

perching on twigs or leaves in places with low light intensity (Setiyono et al., 2017).

15. *Cratilla lineata* (Brauer, 1878)

This species lives alone and is silent on branches in forests and waters with low light intensity. This dragonfly was found perching on a low tree branch in Banyak Angkrem. According to (Sumartin, 2018) this dragonfly is often referred to as the "capung tokerok" while according to Setiyono et al. (2017), this dragonfly has another name for the forest dragonfly. From the observations made, this dragonfly was found in many Angkrem with the number of 2 individuals.

This dragonfly species has a medium size and brown eyes on the top and green on the bottom. The thorax is metallic black with yellow stripes. The abdomen is black with a yellow stripe on the top. Whereas in young individuals the yellow line is located on the side of the abdomen. The distinctive feature of this species lies in the yellow stripe that runs on the thorax to the eighth internode. Transparent wings with black pterostigma. This dragonfly measures 46-48 mm in size with a wing length of 36-38 mm. Whereas females have similarities with males, with the lobe on the ninth segment (Setiyono et al., 2017).

16. *Diplacodes trivialis* (Rambur, 1842)

Diplacodes trivialis is a species of dragonfly found in Banyak Angkrem, from observational data found 12 individual species. This species is found in the grass along the way. Has the local name that is "capung tengger biru"

According to Rahadi et al (2013), male dragonflies of this species have a dominant body color blue-gray, while female dragonflies are yellowish in color. The body size of this dragonfly is small compared to other members of the Libellulidae family. The upper thorax of the male dragonfly is white powder. The body size of this species is 29-32 mm with a wingspan of 22-23 mm. This species prefers to perch on flat places such as rocks, roads and ground level in open areas and settlements (Setiyono et al., 2017).

17. *Pantala flavescens* (Fabricius, 1798)

Pantala flavescens is a type of dragonfly that is a member of the Anisoptera group. Based on observations, this dragonfly is found on the slopes of the hills in Banyak Angkrem, there are about 230 species according to estimates. These dragonflies usually live in groups which can be found in open land. According to Setiono et al (2017), this dragonfly has the local name that is "capung kembara".

This species has a large body with an abdomen between 29-35 mm. Another characteristic of P. flavescens is that it has a dominant yellow body color on the entire body with whitish markings all over the body, black legs and black markings on the sections of its tail. The specific characteristic of P. flavescens is that the hind wings are notched at the base and are wider than the front wings.

According to Sigit et al (2013), Pantala flavescens has a dominant body color of reddish yellow and there are black lines and widened to form spots on the R8-R9, has transparent wings with a red-brown pterostigma, red body color in males and yellow in females. This dragonfly has a higher flight habit than other members of the Libellulidae family (Sigit et al., 2013). This type of dragonfly usually has a habitat in rice fields, grasslands, fields or bushes around the yard of the house and sometimes when the clouds start to get cloudy, it indicates that rain will come its characteristic.

18. *Potamarcha congener* (Rambur, 1842)

Potamarcha congeners are dragonflies of the Anisoptera group of the Libellulidae family. This dragonfly was found at two observation points. Based on the observation data, 7 of these species were found in Kedung Kopong and 41 were found perched on the branching of tall tree branches located in Banyak Angkrem. This dragonfly has the local name of the flat-stomach dragonfly-sambar.

This species has medium size. The males have a dull gray on the thorax and the R1-R4. The rest of the abdomen is golden yellow, except for the R9-R10 which is black. The female dragonfly has yellow-black-orange stripes. The thorax is yellow with 6 black stripes and 1 thick yellowish brown line on the top. Yellowish-orange abdomen with gloomy black rings dividing the segments. There is a protrusion that extends under the R8 which functions to hold the egg when it is about to be placed in the water. This dragonfly is active during the day, perching on stumps or on tall branches. Often also perches on electrical cables in residential areas. Hunting from perch by flying grabbing prey, then returning to its original perch (Setiyono et al., 2017). Habitat of this species can be found in fields or near bamboo vegetation

19. *Zyxomma petiolatum* (Rambur, 1842)

It is a dragonfly of medium size and very slender. This dragonfly was only found in 1 individual in Kedung Kopong. The local name of this species is dragonfly-dusk lampai. According to Setiono et al (2017), male dragonflies have green compound eyes on the top. Yellowish brown frons. Chocolate thorax with a thin white powder. The abdomen is very slim, but rounded at the base. The top is dark brown in black and whiter at the bottom. There is a thin black line that divides the sections. Transparent wings with a hint of brown on the tips, yellowish brown feet. The female is similar, but the abdomen is slightly fatter than the male.

This dragonfly habit is active at dusk. In the mornings and afternoons they spend their time perched in a very shady place. This habitat breeds in ponds, swamps and slow flowing rivers (Setiyono et al., 2017).

CONCLUSION

The difference in location between Kedung Kopong and Banyak Angkrem affects the types of dragonfly diversity found. In Banyak Angkrem which are hilly areas, there are 13 species of dragonflies which are divided into 4 families, namely *Libellulidae* (9 species), *Coenagrionidae* (2 species), *Euphaeidae* (1 species), and *Platycnemididae* (1 species). The most common species found in Banyak Angkrem is *Pantala flavescens*, with as many as 230 individuals.

The needle dragonfly (*Zygoptera*) is found in Kedung Kopong because this area is a water area. In Kedung Kopong, 8 species of dragonflies from the suborder *Anisoptera* were found and 6 species of dragonflies from the suborder *Zygoptera*. The most number of individuals found in Kedung Kopong is Copera marginipes as many as 70 individuals.

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